

REMARKS

Claims 14 through 24, 27 through 31, and 33 through 48 are currently pending in the application. Applicants note with appreciation that the Office Action (Action) states that claims 34 through 48 are allowable. Also, Applicants note with appreciation the fact that the Action states that claims 18 through 20, 23, 24, 29 and 31 would be allowable if rewritten in independent form.

Claims 14 through 17, 27, 28 and 33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,316,165 to Pavelchek et al. (Pavelchek) in view of U.S. Patent No. 4,788,127 to Bailey et al. (Bailey).

Pavelchek describes light absorbing compositions suitable for use as antireflective coating compositions having a low molecular weight resin, a plasticizer compound and/or a low T_g resin. These compositions are suitable for use with photoresist compositions.

Bailey describes a photoresist composition comprising an interpolymers of a silicon-containing monomer and a hydroxystyrene. The photoresist composition is particularly useful with 250 nm to 450 nm wavelength light emitting sources.

Applicants respectfully submit that Pavelchek fails to disclose or suggest the photolithographic sensitive coated substrate of independent claim 14. Claim 14 requires that the radiation-sensitive resist be a chemically amplified resist containing silicon. Pavelchek fails to disclose or suggest a chemically amplified photoresist, as recited in claim 14. This is confirmed on page 5 of the Action, where it states "Pavelchek exemplifies the use of UV5 photoresist from Shipley but fails to offer any further detail about the specific photoresist".

The Action attempts to cure the deficiency in Pavelchek, namely the failure to disclose or suggest a chemically amplified resist containing silicon, with the Bailey

reference. However, Applicants respectfully maintain that one of ordinary skill in the art would not be motivated to use the photosensitive composition having a silicon-containing monomer of Bailey as the topcoat photosensitive layer of the Pavelchek, as suggested by the Office Action, to achieve the photolithographic sensitive coated substrate having a chemically amplified radiation-sensitive resist containing silicon of claim 14.

The compositions of Bailey are for use at exposure wavelengths of 365 nm to 436 nm (see col. 11, lines 22 to 24), whereas the compositions of Pavelchek are for use at the vastly different exposure wavelengths of 193 nm (see col. 5, line 34 of Pavelchek). The problem with using deep UV wavelengths (193 nm) is that resists used at the higher wavelengths (365 nm to 436 nm) are too absorbent and insensitive (see the second paragraph on page 1 of the current specification). Therefore, resists formulated for use with higher wavelength lithography do not work in deep UV lithography applications. Clearly, one of ordinary skill in the art would not be motivated to use a resist designed for use at 365 to 436 nm wavelengths for 193 nm lithography, based on the fact that there is no expectation of success in using high wavelength resists in deep UV wavelength lithography. Therefore, the Action fails to establish *prima facie* obviousness. The mere fact that the cited references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). In the instant case, neither prior art reference cited suggests the desirability of the combination of the deep UV lithography composition of Pavelchek with the resist compositions of Bailey for use in high UV wavelength lithography, and as discussed above, one skilled in the art recognizes that the chemistries used in deep UV lithography are not interchangeable with high UV lithography chemistries.

Even if one were to combine the photosensitive composition comprising a silicon-containing monomer of Bailey with the antireflective coating of Pavelchek, for which there is no motivation, the resultant combination would not disclose or suggest

the photolithographic sensitive coated substrate having a chemically amplified radiation-sensitive resist containing silicon, as recited by claim 14. Despite the Action's contention to the contrary, there remains no disclosure or suggestion that the photosensitive composition comprising a silicon-containing monomer of Bailey is not chemically amplified. Chemically amplified resist materials are developed through the use of acid-labile polymers used to meet the low absorption and enhanced sensitivities required by 193 nm lithography (see the third paragraph of page one of the present specification).

As one skilled in the art would recognize, a chemically amplified resist, such as those of the claimed invention, rely on an acid catalysis to remove a group blocking an alkali solubilizing moiety. Bailey, on the other hand, does not disclose or suggest a resist material, which is chemically amplified. The resists disclosed in Bailey operate by dissolution inhibition mechanisms that are eliminated by photolysis, which turns the dissolution inhibitor into a dissolution promoter by forming a carboxylic acid. There is nothing in Bailey to suggest that their resist compositions are chemically amplified. Moreover, there is nothing in Bailey to support the Examiner's position that the silicon containing moiety of the taught polymer in Bailey is readily acid labile, thereby meeting the limitation of being chemically amplified.

Applicants respectfully submit that claims 15, 16, 17 and 27, which depend from claim 14, are patentably distinguishable over the cited references for at least the reasons set forth above in relation to claim 14.

Applicants respectfully submit that Pavelchek also fails to disclose or suggest the process of claim 28. Claim 28 now includes the feature of the radiation-sensitive resist topcoat being a chemically amplified resist containing silicon. As discussed above in relation to claim 14, Pavelchek does not disclose or suggest a chemically amplified resist containing silicon. Furthermore, process claim 28 requires the forming a coated substrate having a thermally cured undercoat disposed thereon, wherein the thermally cured undercoat comprises a thermally cured composition

having a thermal acid generator. The first paragraph of page 7 of the current specification clearly indicates that the thermal acid generators of the current invention should not be considered photoacid generators. Any sensitivity that the thermal acid generators would have to UV light should be very poor, and they cannot practically be used in photolithography as a photoacid generator. The processes described in Pavelchek for preparing an antireflective coating composition each require a photoacid generator (such as the di-t-butyl diphenyl iodonium camphorsulfonate), not a thermal acid generator as in claim 28 (see citations to col. 16, line 52 to col. 17, line 38). Therefore, Applicants respectfully submit that claim 28, as well as claim 33 which depends from claim 28, is patentably distinguishable over the cited references.

Claims 14 through 16, 21, 22, 27, 28, 30 and 33 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,165,697 to Thackeray et al. (Thackeray) in view of Bailey.

Thackeray describes antihalation compositions and methods for reducing the reflection of exposure radiation of a photoresist coated over the compositions. The compositions comprise a acid generator, a resin binder and material capable of causing a thermally induced crosslinking reaction of the resin binder.

Applicants respectfully submit that Thackeray does not disclose or suggest the photolithographic sensitive coated substrate of independent claim 14. Again, claim 14 requires that the radiation-sensitive resist be a chemically amplified resist containing silicon. The Office Action notes on page 7 that while Thackeray exemplifies the use of MEGAPOSIT SNR248-1.0, it does not disclose or suggest a radiation-sensitive resist containing silicon, let alone a chemically amplified resist, as recited in claim 14. Therefore, Applicants respectfully submit that claim 14 patentably distinguishes over the cited reference.

Further, as discussed above in relation to Pavelchek, one of ordinary skill in the art would not be motivated to use the photosensitive composition having a silicon-

containing monomer of Bailey as the topcoat photosensitive layer of Thackeray, as suggested by the Office Action to achieve the photolithographic sensitive coated substrate having a chemically amplified radiation-sensitive resist containing silicon of claim 14. As the antihalation compositions of Thackeray are designed for use at the deep UV wavelength of 248 nm, the arguments for the lack of motivation to combine the compositions of Pavelchek with the resist of Bailey apply equally well to the Thackeray. Additionally, Bailey (see above) does not disclose or suggest a chemically amplified resist. Therefore, as above, even if one were to combine Bailey with Thackeray it would not disclose or suggest the photolithographic sensitive coated substrate having a chemically amplified radiation-sensitive resist containing silicon of claim 14. As such, Applicants respectfully submit that claim 14 is patentably distinguishable over the cited references.

Applicants respectfully submit that claims 15, 16 and 27, which depend from claim 14, are patentably distinguishable over the cited references for at least the reasons discussed above in relation to claim 14.

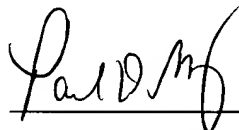
Applicants respectfully submit that Thackeray also fails to disclose or suggest the process recited in claim 28. Claim 28 also requires the feature of the radiation-sensitive resist topcoat being a chemically amplified resist containing silicon. As discussed above in relation to claim 14, Thackeray does not disclose or suggest a chemically amplified resist containing silicon.

In addition, Applicants respectfully submit that Bailey fails to cure the deficiency of Thackeray, in that Bailey also fails to disclose or suggest each and every limitation of claim 28, notably, the feature of the radiation-sensitive resist topcoat being a chemically amplified resist containing silicon. Therefore, Applicants respectfully submit that claim 28, as well as claims 30 and 33 which depend from claim 28, is patentably distinguishable over the cited references.

In view of the foregoing, Applicants respectfully submit that all claims presented in this application patentably distinguish over the cited prior art taken either alone or in combination. Accordingly, Applicants respectfully request favorable consideration and the passage of this application to allowance.

September 30, 2003

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Paul D. Greeley", written over a horizontal line.

Paul D. Greeley
Attorney for Applicants
Reg. No. 31,019
Ohlandt, Greeley, Ruggiero & Perle, LLP
One Landmark Square, 10th Floor
Stamford, CT 06901-2682
Tel. (203)327-4500
Fax. (203)327-6401